January 8, 1997
NARRATIVE FOR
MCPHERSON AND EDMUNDS COUNTIES, SOUTH DAKOTA
OIL & GAS DEVELOPMENT POTENTIAL MAPS

INTRODUCTION

McPherson and Edmunds Counties lie east of the Missouri River in north-central South Dakota. The topography in these counties consist primarily of flat glaciated plains. Geologically, the southeast edge of the Williston Basin runs through the center of McPherson County and along the northwest edge of Edmunds County. A Precambrian high, the Transcontinental Arch, runs through the southeast corner of Edmunds County. This structural high is responsible for the thin sedimentary cover in this area. There are no producing oil and gas wells in this county.

OCCURRENCE POTENTIAL

Most of McPherson and Edmunds Counties contain moderate oil & gas occurrence potential. This is based on regional geologic mapping (Mallory, 1972, p. 56) that indicates the county contains 2000-5000 feet of sedimentary rocks. This is the same, but thinner package of rocks which contain source beds and producing reservoirs in other parts of the Williston Basin.

The extreme southeastern portion of Edmunds County is rated low occurrence potential. This is based on regional geologic mapping (Mallory, 1972) which shows this part of South Dakota to have less than 2000 feet of sedimentary rocks, due to the influence of the previously-mentioned Transcontinental Arch.

The type log for these counties, taken from a water well drilled in T.123N.,R.66W., Sec. 25, contains 1396' of sedimentary rock and terminated in Cretaceous Dakota Sandstone. No well in these counties penetrated granite, but wells in nearby counties indicate the Precambrian is just below the Dakota Sandstone in this part of the state.

DISCUSSION OF DEVELOPMENT POTENTIAL RATINGS

The west half of McPherson and the extreme northwestern township in Edmunds County is classified as moderate development potential. This is due to: 1) the boundary of the Williston Basin, 2) the thin sedimentary cover in these counties, 3) the few number of wells that were specifically drilled for oil and gas exploration, and 4) the lack of oil and gas shows in any of the wells drilled. Wildcatting may occur in this county in the next 15 years. This will involve one wildcat well being drilled per township, if that. Should a major discovery be found in any of these townships, that particular township will experience additional drilling activity.

The rest of the counties are classified low development potential because: 1) these areas are outside the confines of the Williston Basin, 2) the thin sedimentary cover in these counties will limit oil and gas exploration, and 3) the lack of data due to no wells being specifically drilled for oil and gas exploration in this area. Widely-spaced wildcatting may occur in this area in the next 15 years.

REFERENCES CITED

Mallory, W.W. (ed.), 1972, Geologic atlas of Rocky Mountain Region: Rocky Mountain Association of Geologists, p. 56.